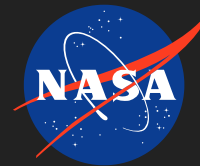


# Integrated CubeSat ADACS with Reaction Wheels and Star Tracker, Phase II

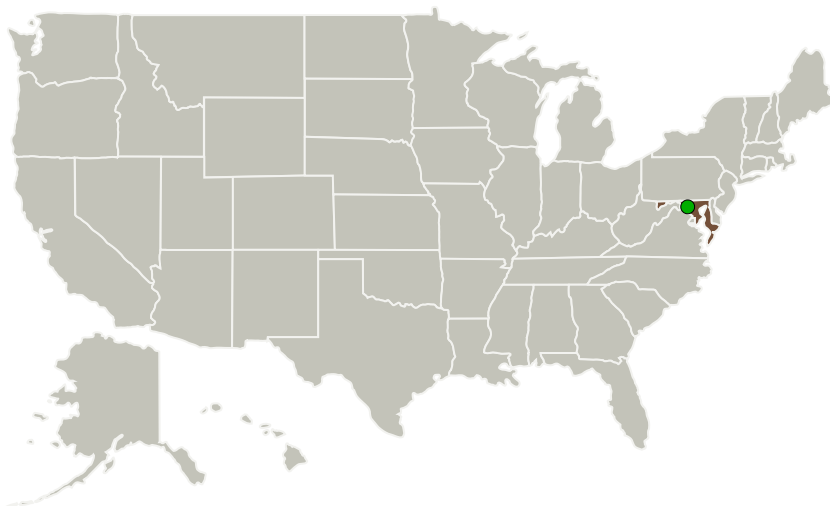
Completed Technology Project (2013 - 2017)



## Project Introduction

The MAI-400SS Space Sextant is a precision attitude determination and control system for CubeSats and Nanosats. The MAI-400SS enables future CubeSat missions with precision fine pointing (0.1deg) and dynamic slewing as will be required for imaging operations of ground targets. A flight control computer, 2 Star Trackers, 3 reaction wheels and 3 electromagnets are incorporated in a 4" x 4" x 3" (3/4U) CubeSat sized module. The system is based on the highly successful MAI-400 miniADACS and extends its performance capability to the 0.1deg range by incorporation of 2 star cameras and attitude determination software. Phase I developed the software algorithms and prototyped the star cameras and electronics. Phase II consists of a development program culminating with a system at TRL 7. The technology is significant because it extends the capability of current low cost Nanosats to tactical imaging and other missions requiring fine pointing and dynamic retargeting, missions hitherto restricted to large and expensive spacecraft. The MAI-400SS will facilitate rapid development of low cost satellites by providing a turnkey system which would be capable of determining and controlling spacecraft attitude automatically; simplifying operations and enabling rapid mission development as envisioned by ORS.

## Primary U.S. Work Locations and Key Partners



## Integrated CubeSat ADACS with Reaction Wheels and Star Tracker, Phase II

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# Integrated CubeSat ADACS with Reaction Wheels and Star Tracker, Phase II

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Organizations Performing Work	Role	Type	Location
Adcole Maryland Aerospace, LLC	Lead Organization	Industry	Crofton, Maryland
 Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

## Primary U.S. Work Locations

Maryland

## Images



## Briefing Chart Image

Integrated CubeSat ADACS with Reaction Wheels and Star Tracker, Phase II  
(<https://techport.nasa.gov/image/134652>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

Adcole Maryland Aerospace, LLC

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

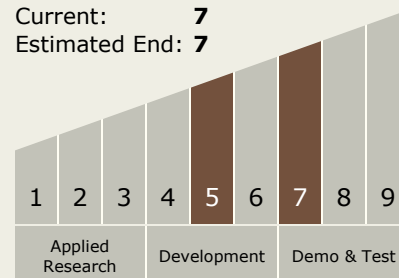
Carlos Torrez

### Principal Investigator:

Steve Fujikawa

## Technology Maturity (TRL)

Start: 5  
Current: 7  
Estimated End: 7



# Integrated CubeSat ADACS with Reaction Wheels and Star Tracker, Phase II

Completed Technology Project (2013 - 2017)



## Technology Areas

### Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
  - └ TX17.2 Navigation Technologies
    - └ TX17.2.5 Rendezvous, Proximity Operations, and Capture Sensor Processing and Processors

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System